

Maggot Protein Production Machine

- **Katharina Unger has developed a maggot-breeding device for the kitchen**
- **It produces Black Soldier larvae which contain up to 42 per cent protein**
- **The cooked larvae 'smell like starchy potatoes and have a nutty taste'**

By [Ellie Zolfagharifard](#)

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Quorn, soya and tofu - It seems they have all had their day as protein-rich meat substitutes.

Now, one Austrian woman claims that the new super food set to take over our kitchen counters is maggots.

And she has developed a new machine to make cooking up dishes much easier.

Scroll down for video



The Farm 432 device can harvest half a kilogram of larvae every week, which is enough for two meals. The woman behind the Farm 432 device, Katharina Unger, said the machine is designed to be the perfect environment for flies and their larvae allowing in enough light and space for them to grow

The woman behind the Farm 432 device is Katharina Unger, an industrial design graduate of University of Applied Arts in Vienna, who wants to tackle the factory farmed meat industry by growing protein at home

Read more: <http://www.dailymail.co.uk/health/article-2382034/Farm-432-machine-uses-maggots-grow-protein-home.html#ixzz2e8TxCfGh>

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The Farm 432 device can harvest half a kilogram of larvae every week, which is enough for two meals.

She describes the cooked larvae as smelling like starchy potatoes with a nutty and meaty taste.

The machine is designed to be the perfect environment for flies and their larvae allowing in enough light and space for them to grow.



Katharina Unger recommends eating the larvae with tomato risotto. 'I like to mix parboiled rice with wild rice together with the larvae, put a lot of tomato sauce in it and a bit of parmesan cheese,' she said

A MEATY PROBLEM

By 2050 meat production will need to increase by 50 per cent to meet population increase.

Katharina Unger predicts that because we already use one third of croplands for the production of animal feed, it will be necessary to develop alternative food sources and production methods.

The United Nations is in agreement. In a recent report, it suggests that insects are a viable source of protein for humans, animals and pets.

The report highlighted grasshoppers, ants and other bugs as protein-packed substitutes that are less harmful to the environment than traditional meat.

While the current design is for home use, the system can be scaled up for professional kitchens.

It is also easy enough for anyone to use, she says. To begin with, you simply drop some black soldier fly larvae into an appliance chamber.

Here they grow and then move to a larger chamber, mate and produce larva.

This falls down into a separate area, where it matures, moves on up a tube, and falls into a cup.

Some larvae are dropped back into the machine to restart the process, while the rest are ready to eat.

Black Soldier flies were chosen as they are easy to breed and contain up to 42 per cent protein - double the amount in the average chicken breast - and a high level of calcium and amino acids.

A gram of Black Soldier fly eggs can become 2.4 kilograms of edible protein after 432 hours in the Farm 432.

But if Black Soldier flies aren't to your taste then other larvae may be used in the same way.

Farm 432: How to breed insects for food



The cooked larvae are said to smell like starchy potatoes and have a nutty and meaty taste



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Speaking with [Dezeen](#), Ms Unger recommends eating the larvae with tomato risotto.

‘I like to mix parboiled rice with wild rice together with the larvae, put a lot of tomato sauce in it and a bit of parmesan cheese,’ she said.

‘A bit of parsley or basil on top and you have a perfect meal.’



A machine that breeds maggots for your dinner table could soon be found on a kitchen counter near you

Read more: <http://www.dailymail.co.uk/health/article-2382034/Farm-432-machine-uses-maggots-grow-protein-home.html#ixzz2e8UurwDC>

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Yeah, so this is pretty gross. But there's some sense in it as well. Designer and Fulbright scholar Katharina Unger wants to tackle the looming problem of overpopulation and food shortage with something she's calling Farm 432. It's a countertop contraption whose only purpose is to provide a fertile environment for fly larvae (otherwise known as maggots) to breed, grow, and... *turn themselves into food*. In as little as 18 days (or 432 hours), 1 gram of fly eggs can turn into 2.4 kilograms (5.3lbs) of theoretically edible maggots; Farm 432 just makes it simple as pie to grow and harvest them. You feed them scraps of leftover food, and very little water and the insects take care of themselves. Once the eggs hatch, and the larva have grown somewhat, they prepare to pupate and turn into flies. So they'll look for a drier, safer place to do so, which leads them up a ramp and into an eventual trap. Once in the trap, it's your turn to grab them and... *cook them*. Maggots are 72% protein, as well a lot of calcium and amino acids.

Granted this all sounds awful for a western population that generally doesn't eat insects. But looked at through a purely practical point of view, it's not a completely unreasonable contribution to one of mankind's biggest problems of the relatively near future. Farm 432 only seems to have a prototype (or maybe even just some good CG renders) at the moment and we can't find information on commercialization. We don't expect there to be much demand for this either... for now anyway.

Hit the jump for a few more pictures, including some of the, uh, resulting food.

The recent graduate from the University of Applied Arts in Vienna and current Fulbright Scholar devoted her thesis project, called Farm 432: Insect Breeding, to developing an appliance that incubates insects for human consumption.

The striking blue and white vessel is stocked with one gram of black soldier fly eggs, and over a period of 18 days, the eggs move through the device's chambers, gestating, reproducing, and ultimately producing 2.4 kilograms of nutritious, if slightly nauseating, fly larva.

This frightful food processor was invented to satisfy the meat cravings of the nine billion people expected to be living on Earth in 2050. To support that population, protein production will have to double and farming, primarily livestock cultivation, already uses up half of the planet's arable land, making it difficult to expand

How to Build a Giant Maggot Farm

By Thomas Ganio, eHow Contributor

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A collection of maggots within a small container.

The thought of farming or cultivating maggots may sounds disgusting. Most people would never envision such a farm as a possible moneymaking opportunity. Yet, the growing of maggots can make some farmers thousands to hundreds of thousands of dollars a year. Maggots are used in forensic laboratories as well as in landscaping when it comes to compost and waste management. The main reason for farming maggots are for fishing bait -- panfish and trout are particularly susceptible to maggots. When it comes to building a large maggot farm, those new to the workings of a farm should know the basics in successfully raising maggots for profit.

Other People Are Reading

-  [How to Grow Maggots in Winter](#)
-  [Why Do Maggots Grow on Meat?](#)

Things You'll Need

- 5,000 maggots
- 4-by-4 foot long container
- Rotted meat, fish, or poultry
- Grain or wheat flour Mashed dry potatoes Shredded newspaper and a light coating of water Mesh liner Show (4) More

Instructions

1.

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1

Purchase 5,000 maggots through online dealers, pet stores or fishing bait wholesalers. The maggots will develop, burrow, and scamper inside the container. Place decaying leaves and some small plants in the jar to provide food. This will suffice until the maggots metamorphose into flies. If raising maggots to sell to forensic laboratories or research facilities, purchase maggots of high quality from a reputable retailer. However, if your maggot farm is intended for bait fishing and compost and waste management, the species of maggot is not as important.

○

2

Fill a 4-by-4 foot long container with rotted meat, fish, or poultry, along with grain or wheat flour, mashed dry potatoes, shredded newspaper and a light coating of water, which will provide moisture. You can substitute the water with milk that will ripen and reek in a few days, generating a foul smell that will bring in flies.

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3

Check the containers daily for maggots. Once you see the first maggot, assume that more exist. A female fly can lay approximately 300 eggs at one time or live birth just as many live maggots.

○

4

Move the container inside an enclosed room and leave maggots undisturbed for several days.

o 5

Cover the container on the first sightings of maggots. Keep a thin mesh liner over top of the plastic container at all times when not feeding the maggots. This will prevent maggots from escaping the container and will keep transforming flies within the netting.

o 6

Examine the growth on a daily basis. Maggots can range from 1.25 to 2 inches long, and the creature has tan, yellowish skin. Feed your growing maggots a commercially prepared food. For a large maggot farm, 5,000 maggots or more, replenish food within the container every five days. Additionally, make sure to add small amounts of water or moisture.

o 7

Collect the adult maggots that are larger than 1 inch. Remove all the food within the container. Carefully, scrape off any maggots clinging to the food or materials and place them within a dry bucket. On removing the mesh netting, some maggots that turn into flies will escape. Try to keep as many flies within the covering as possible, as the dead adult flies become additional feed for future offspring of maggots.

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How to Keep Maggots Alive Longer

By Zach Lazzari, eHow Contributor

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Store maggots in a dry container to minimize foul odors.

The maggot is considered a pest by most but many anglers use the cream colored larva as bait. Storing the maggots in a [live](#) condition is possible in a temperature-controlled setting. The maggots eventually die and the angler must monitor the health to ensure the maggots are lively before fishing. Extending the life of the maggot is an easy task but be prepared for a strong smell to develop in the storage area.

Other People Are Reading

-  [How to Keep Maggots for Fishing Bait](#)
-  [How to Build a Giant Maggot Farm](#)

Instructions

1.

- 1

Place a thin layer of sawdust or shredded newspaper in a plastic tub. Fill the bottom layer of the tub with two inches of bedding. Deep bedding makes it difficult to monitor the [health](#) of the maggots.

- 2

Place the maggots on a screen and sift the screen to remove moisture and particles from the old [bedding](#). Dump the maggots into the plastic container.

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- 3

Cover the plastic container with a window screen. Use a fine mesh screen that is not easily penetrated by the maggots. Tape or clamp the screen on the tub, if desired, but the weight is typically enough to hold the maggots in the tub.

- 4

Place the covered plastic bin in a refrigerator. Maintain a temperature of 35 degrees Fahrenheit to extend the life of the maggots. Temperature fluctuations are responsible for decreasing the life of the maggots.

- 5

Monitor the maggots and change the bedding one time each week. Maintain dry bedding to extend the life of the maggots.

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Read more: http://www.ehow.com/how_8475630_keep-maggots-alive-longer.html#ixzz2e8ZXUyGf

Protein from Thin Air:

Breeding Fly Maggots for Poultry Feed

A Crucially Important Advisory to the Reader

Please be advised that, despite what is said below about the chances for disease with this system, and despite the fact that I have used it successfully for years, I have recently indeed had problems—including deaths of several chickens—that probably resulted from “limberneck”—that is, botulism poisoning.

On one occasion, I cycled through the maggot buckets offal from chickens (from a buddy who came over to share my equipment) that had not been properly starved—their crops were filled with feed, which may have soured and supported the growth of *Clostridium botulinum* (the microbe that produces botulinum toxin). In another, I put a couple of groundhogs into the buckets that had been sitting around perhaps too long—maybe the *C. botulinum* had had longer to get a start, than it would have if I were using fresher carcasses.

In any case, I have a duty to warn the reader about these problems I have had, and advise that I'm more cautious about use of this method of generating “free protein” than when I wrote this article. I have not given up on the maggot buckets—I may well experiment further to determine how to reap the benefits of the system, without creating a danger to my flock—but for the moment I have suspended use of the maggot buckets. Fresh carcasses that come my way I am feeding to the layer flock *directly*, not as maggot-generating substrate. My past experience indicates that the chickens resist eating a carcass encased in fur. However, if I open it up a bit with a hatchet, they utilize the muscle tissue and internal organs quite efficiently.

If there is an inherent problem with the maggot buckets, it has much to do with the *anaerobic* nature of the feeding medium—anaerobic conditions are more conducive to pathogens (including *C. botulinum*) than aerobic ones. That's why I am excited about use of **Black Soldier Fly larvae** for responsibly recycling various organic residues, recapturing their residual nutrient content for soil fertility applications, and even (as with blowfly maggots) generating high quality live animal feed for the flock (42% protein, 35% fat on a dry-weight basis). I am now experimenting with a “BioPod” for working with this species. The feeding activity of BSF larvae is a *much more aerobic* process, with a greatly reduced chance there could ever be a disease complication.

My next article in [Backyard Poultry Magazine](#) will be an introduction to Black Soldier Fly; and eventually I will post more information on the site. In the meantime, please check [Black Soldier Fly Blog](#) and [The BioPod](#) for more information. Stay tuned!

~Harvey, August 1, 2009

This article was published as a sidebar to “Feeding the Flock from the Homestead's Own Resources” in the Oct/Nov 2006 issue of [Backyard Poultry Magazine](#).

Using food grade 5 and 7 gallon buckets, I drilled numerous 3/8-inch holes in the bottoms, sides, and screw-on lids. (Holes of this size allow flies to enter, but prevent pecking by the chickens.) My buddy Sam keeps me supplied with 30-35 lb beaver carcasses. These I seal inside the buckets. After just a few hours, flies have “blown” the carcasses with eggs, which within a day hatch into a mass of greedily feeding larvae, or maggots.



Suspend the Buckets

Please note that for this system to work, *it is essential that the buckets be suspended*, either by hanging (from a tree or a rafter of a shelter) or by placing on a wire platform. When the larva has grown enough to pupate, it has the instinct to leave the feeding medium and burrow into the ground—it will not pupate in the feeding medium. By suspending the buckets, I ensure that larvae migrating out of the carrion will free-fall, attracting the attention of the ever-alert chickens, who instantly snap them up.

I have found the beaver carcasses from my friend to be tremendously productive. He also passes on the occasional raccoon, and I have even cycled the odd roadkill through my buckets, as well as a groundhog who sadly did not understand the intensity of my feelings about my sweet potato planting. When I slaughter poultry for the table, I now run the offal through the buckets as well—a more efficient, and productive, way of disposing of them than burying or composting. I even put in any domestic birds that died by accident, though of course do not use carcasses of birds who may have died of disease.



Divide the Carcass

No doubt the reader has anticipated potential problems with the use of carrion to breed maggots, so let's consider them:

Odor

The first beaver Sam gave me I simply stuffed, whole, into my largest bucket. The bucket produced an abundance of maggots but, not surprisingly, smelled pretty “ripe” during the last few days of “processing.” I now have five working buckets, so I chop each beaver carcass into five pieces. I line the bottoms of the buckets with litter from the poultry house (mostly oak leaves), lay in the beaver chunks, then pad with more leaves around and on top, and screw on

the lids. (The loose leaves do not impede access to the carrion by the flies.) With this adjustment, I find that the processing time—the time from carrion addition until the maggots have reduced it to hair and bones—is greatly accelerated, and there is very little smell. Indeed, I catch a whiff only when I am working in the immediate vicinity of the buckets. (Suburban flock owners, however, would do well to seek free protein elsewhere.)

Curiosity seekers

The buckets would certainly draw dogs, foxes, raccoons, and other curiosity seekers if allowed access to them. Therefore this system is useful only where access can be denied. I use [electric net fencing](#), and never have problems with raids on the buckets. Placing the buckets inside permanent predator fencing would work as well. Only once have I had a visit from buzzards, drawn to that first heavily scented bucket. They hung around most of a day, clearly intoxicated by the heady aroma, but frustrated they could not get at its source. They finally gave up and lumbered into flight, never to return. I think the lack of repeat visits has much to do with the greatly reduced odor in the buckets these days.

“Breeding flies”

Many people have objected to my system because it amounts to a deliberate breeding of flies. Let me emphasize that I am breeding *fly maggots*, not flies, and actually my methods should *decrease* the ambient fly population. Imagine there are 100 female flies in the vicinity, and I manage to convince 20 of them that my carrion buckets are the best place imaginable to lay their eggs. They do so (rather than laying them elsewhere). But not a single fly larva gets to pupate and hatch—my sharp-eyed chickens see to that. I’ve just reduced the local fly hatch by 20 percent.

Disease

Naturally my reader, however dedicated to the ideal of self-sufficiency, will worry about the potential for generating disease out of carrion worked by maggots. I am duty bound to pass on industrial-strength warnings I’ve received to that effect: There is a condition the old-timers called “limberneck,” which turns out to be paralysis caused by botulin poisoning. My friends who warned me about limberneck insisted that it could be caused by maggots ingested by chickens from *any* source. However, in all the links they sent, the references actually described the condition associated only with *spilled feed* which had become wet, had soured and begun working with maggots, and then been consumed by the birds. Sounds to me as if the botulism bacterium was growing in the soured feed mash, not in the maggots. In any case, I have always avoided using a grain mash as a maggot breeding substrate. However, I fed carrion-bred fly larvae the entire fly season last year, and this season I have honestly lost track of the number of beaver carcasses I’ve put through my buckets—and I have not had a hint of a disease problem. Neither has my longtime mentor Joel Salatin, who follows beef cattle on his pastures with a big flock of laying hens, who scratch apart the cowpies for the maggots growing in them. Based on

such solid experience, I conclude that the homestead flock owner need not fear disease if he chooses to tap into this rich source of free protein.

[Top of page](#)

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How to Grow Maggots for Chicken Feed

By an eHow Contributor

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Feeding maggots to chicken is an easy and economical way to provide protein and fat. Most people will immediately picture a smelly pile of garbage with house fly maggots feasting on rotting meat, but it is not the case. While it would be possible to use house fly maggots, the problems with smell, fly infestation and transmission of diseases are almost insurmountable. Using soldier fly maggots solve all of those problems. They feast on a regular compost pile, but the absence of meat limits the occurrence of diseases. Soldier fly

maggots are also auto-harvesting and adult soldier flies both stay away from humans and secrete a pheromone that repels house flies. [Have a question? Get an answer from a Veterinarian now!](#)

Other People Are Reading

Read more: http://www.ehow.com/how_5723193_grow-maggots-chicken-feed.html#ixzz2e8aeKN4J

Instructions

1.

o *1*

Build or re-purpose a container to grow your maggots. You need to use a container from which the maggots cannot escape. Do not use a compost pile with an open bottom. Commercial solutions such as the Biopod are available to you if you do not wish to build your own container. Install a ramp around the container for the maggot to climb. Drill a hole at the top of the ramp. The maggots ready to become adults will instinctively get out of the pile and proceed up the ramp. You can either put the container in the chicken area and let the maggots be eaten by the chickens as they get out of the container or put a bucket under the hole to collect them.

o *2*

Collect soldier fly maggots from an existing compost pile. If you do not have an available compost pile to harvest, order maggots online or leave the container open and hope some soldier fly maggots will lay their eggs in it. Once you have a colony established, the adult soldier fly maggots will keep coming back as long as there is food in the container. Fill the container with manure, kitchen scraps without meat or any green material. Keep the material moist, but do not soak it; this will drown the maggots.

o

o *3*

Keep the pile warm. Leave it in an heated barn and use thick insulation when building the container. With enough soldier fly maggots the temperature inside the container will be kept around 90 degrees F. If there are not enough maggots to sustain the temperature levels needed, the maggots will take longer to mature (as long as 6 months). You can also use a passive solar system to maintain a regular temperature.

Read more: http://www.ehow.com/how_5723193_grow-maggots-chicken-feed.html#ixzz2e8az5GyK

How to Raise Maggots for Chooks

By an eHow Contributor , last updated May 31, 2013

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How to Raise Maggots for Chooks

Maggots are often associated with the decomposing animal on the side of the road where house flies encircle. However, maggots can be raised from a different fly that makes the process more friendly. The Black Soldier fly maggot has several advantages of the house fly maggots. The maggot will feed on green material in a compost pile as well as manure, the Maggot is self harvesting and the soldier fly itself does not interact with humans and produce a pheromone that repels house fly from the area. Building a 3-by-3-feet container to raise your maggots is easy and can be scaled to any level of production. [Have a question? Get an answer from a Veterinarian now!](#)

Other People Are Reading



[How to Grow Maggots for Chicken Feed](#)

-  [How to Stop Flies and Maggots from Hatching in Your House](#)

Things You'll Need

- Plywood
- Drill
- Screws
- Nails
- Hammer
- Foam insulation board
- 6mil plastic sheeting
- Show (4) More

Instructions

1.

- [1](#)

Cut six 3-by-3-foot plywood squares. [Glue](#) and nail four pieces to make a box without bottom or lead. Install the insulation on the outside of the box using glue or double sided tape. Install a 4-by-3 inch plywood ramp on 2 sides of the box inclined to 30 to 35deg.

- [2](#)

Install insulation on one 3-by-3-foot plywood sheet and cover it with thick plastic sheeting and staple it to the back of the plywood. Lay the piece insulation up where you want the maggots to grow and put the previous piece on top with the ramp up.

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Drill a 1-inch hole on top of each ramp and glue two small piece of scrap wood forming a cone to force the maggots through the hole. Glue a 2-inch lip on the outside of the box under the hole and put a bucket under it to collect the maggots.

- [4](#)

Cover the last 3-by-3-feet plywood sheet with insulation and plastic sheeting to make the lead. Dump your compost material in the box and spray some water. Spray just enough for the material to be release a few drops of water when quizzed in your hand.

o 5

Purchase for a store or capture solder fly maggots from an existing compost pile and introduce them in your bin.

Read more: http://www.ehow.com/how_5744717_raise-maggots-chooks.html#ixzz2e8bDjzek

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maggot farming methods

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Life Cycle of the Zombie Fly *Apocephalus borealis*

Female flies find a bee.



A Female Zombie Fly Laying Eggs inside a Honey Bee

Fly larvae (maggots) eat the insides of a bee, killing it.



A Maggot Emerging from a Honey Bee

Maggots pupate nearby.



A Honey Bee Surrounded by Zombie Fly Pupae

Adult flies emerge from pupae and mate.



A Female Zombie Fly